

Navy Region Southwest Sustainability

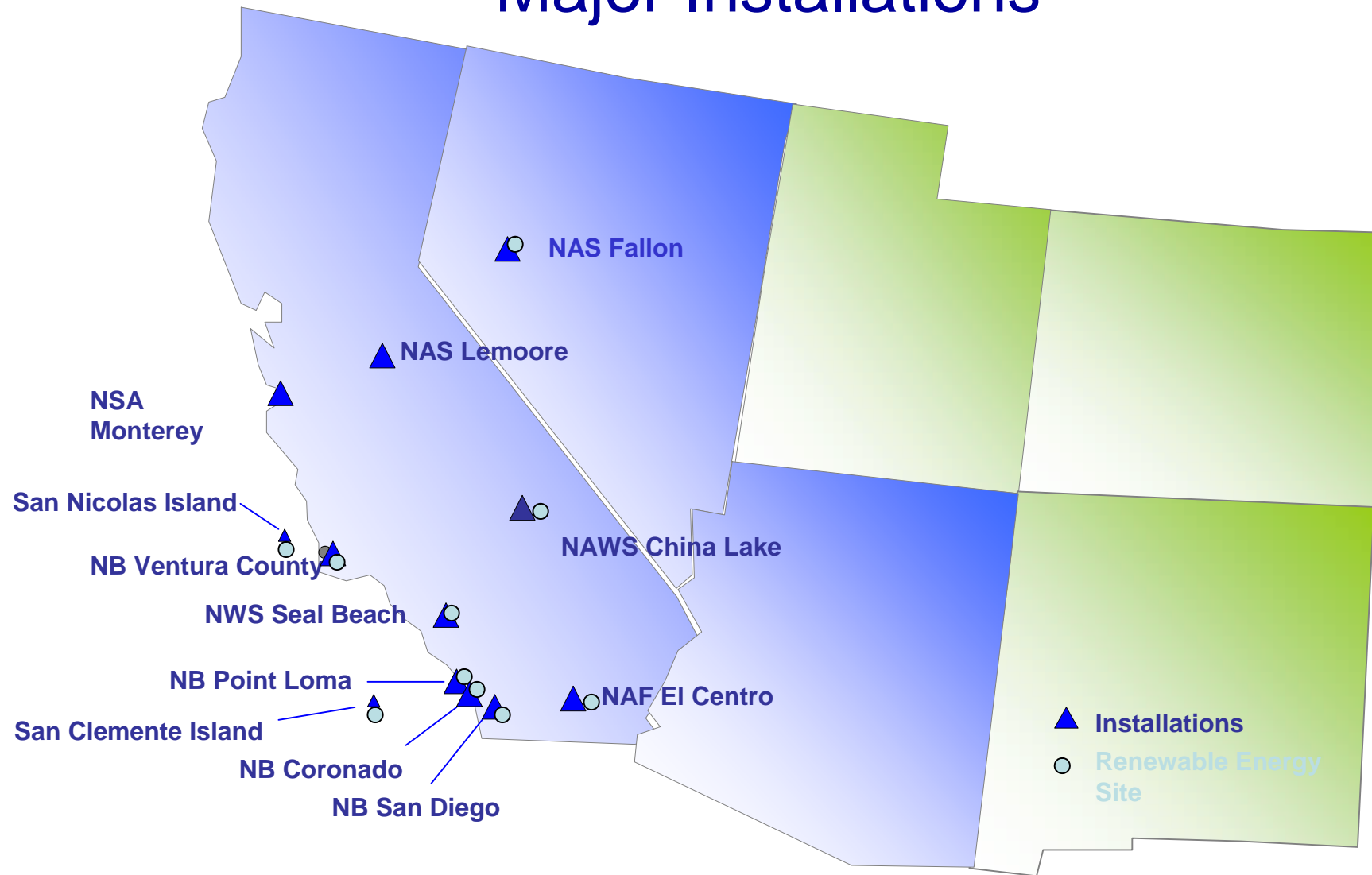


November 2008



Navy Region Southwest

Major Installations





Outline

1. Introduction to Regional Energy
2. Renewable Energy Initiatives
3. Energy Success Stories
4. Water Conservation Success
5. Natural/Cultural Resources
6. Integrated Solid Waste
7. Green Buildings
8. Biofuels
9. Partnering



Introduction

- Facilities square footage: 78,000,000
- Annual Electricity consumption: ~1,140 giga watt hours
- Peak Demand: ~200 mega watts
- Annual Electricity generated: ~51 giga watt hours
- Natural gas consumption: ~1,570,000 MBTU
- Propane consumption: ~28,000 MBTU
- Diesel consumption: ~162,000 MBTU
- Steam generated: ~250,000 MBTU
- Renewable infrastructure in place:
 - Solar: ~1.8 mega watts
 - Wind: 675KW
 - Solar-Thermal: 4,950 MBTU



Renewable Energy Initiatives

Naval Base San
Diego – Pier 8
Solar carport

115 KW





Renewable Energy Initiatives

Naval Base Point Loma

Solar carport

57 KW





Renewable Energy Initiatives

Naval Base San
Diego

Solar carport

57 KW





Renewable Energy Initiatives

Naval Air Weapons
Station – China Lake

Solar carport

116 KW





Renewable Energy Initiatives

Naval Air Facility
El Centro

Solar carports

50 KW





Renewable Energy Initiatives



Naval Base Coronado

807 KW solar carport

- Very predictable/ reliable
- Exceeding expectations
- DoE Energy Showcase Site



Renewable Energy Initiatives

Roof top solar

Naval Base Point Loma

Building 564
29.5KW





Renewable Energy Initiatives

Photo to the Right
Naval Base Coronado

Naval Surface Forces HQ
30 KW



Photo to the Left
Roof top solar
Naval Base Coronado
Building 678
21.6KW



Renewable Energy Initiatives

Roof top solar

Naval Weapons
Station Seal Beach

Building 16
24 KW





Renewable Energy Initiatives

Roof top solar

Naval San Diego

Building 3300
15 KW





Renewable Energy Initiatives

Naval Base Coronado

51 KW

- Navy's first building integrated photovoltaic (BIPV) roof



Bldg 352, SH-60 Simulator Facility

- Nominated for White House Closing the Circle Award 2008



Renewable Energy Initiatives



Completed BIPV Roof – Bldg 352 Naval Base Coronado

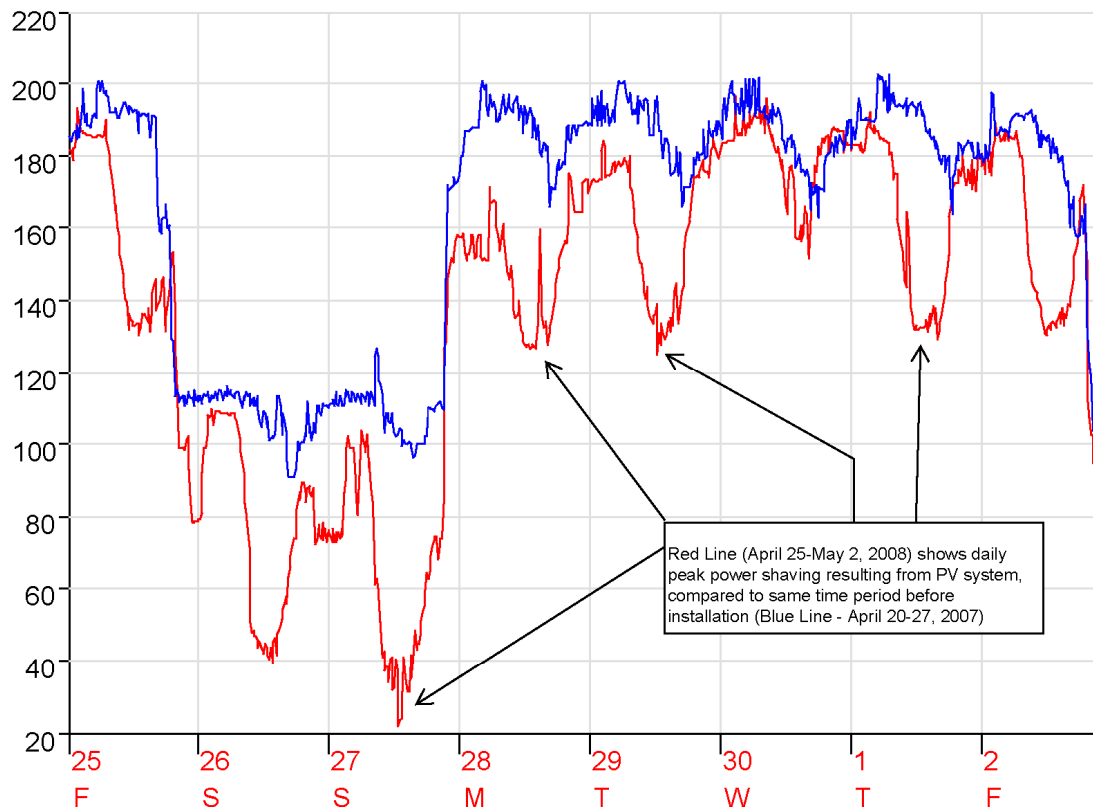


Renewable Energy Initiatives

KW (channel: 1 Set: 0)

Comparison Graph

NI-B-352-1



Add Line

NI-B-352-1

NI-B-352-1

Bldg 352 Comparison

Before/ after BIPV



Renewable Energy Initiatives

San Clemente
Island

675 KW wind
energy





Renewable Energy Initiatives

San Nicolas Island

Wind:

900 KW Planned (ECIP)

- FY09 project
(approved) (300KW)
- FY10 Phase II
(400KW)
- FY11 Phase III
(200KW)





Renewable Energy Initiatives

Solar Thermal

Naval Base San
Diego

Swimming pool
heating





Renewable Energy Initiatives

Geothermal

Naval Air Weapons
Station China
Lake

272 MW

- Contractor owned/ operated
- Power goes to SoCal grid
- Public/ Private Venture





Renewable Energy Initiatives

Geothermal

NAS Fallon

- Proposed 25 MW plant
- Testing on-going
- Power would go to commercial grid
- Proposed Public/Private Venture

Other:

Exploration to various degrees is ongoing at other sites: NAF El Centro, and Twentynine Palms and the Chocolate Mountain Marine Corps Bases.





Renewable Energy Initiatives

- Multi-year effort
 - Short, mid, and long-range efforts
- Identify opportunities across the southwest
 - Projects
 - Industry partnerships
- Renewable development opportunities
 - Power purchases
 - Energy Joint Ventures
- Goal to become >90% renewable by 2025
- Incentives driven
 - Investment tax credit (extended through 2016)
 - State/ local (CA solar initiative (CSI); NV renewable energy credits)



Energy Success Stories

- 2008 SECNAV Energy Awards
 - All NRSW installations achieved Platinum or Gold
 - Large shore (NB Ventura County) and Small Shore (NB Point Loma)
- 2008 DoE – FEMP Awards
 - NB Ventura County – Small Team energy efficiency
 - Individual – Exceptional Service



Energy Success Stories

Shipboard Energy Management Pilot Study

- ASN assigned initiative
- NRSW oversight
- Identify measures to reduce in port utilities
- Promising results
 - Reduced load
 - Energy savings
 - Air compressor plant partial shutdown
 - No cost actions
- >\$4M*
- >56,000 MBTU
 - >16M kilo-watt hours

*Actual cost savings – marginal costs





Energy Success Stories

Resource Efficiency Managers (REM)

- NRSW utilizes REMs at each installation
 - Key energy program tool
 - Leverage industry expertise
 - Increased identification of opportunities
 - Typically realize >2:1 ROI
- All Navy shore platforms currently moving in same direction



Energy Success Stories

Fast-payback Energy Projects

- NRSW initiated program
- \$500K annual sustainment funds dedicated to energy efficiency projects
- Target projects with ROI 1-2 years
- FY09 increasing to \$1M
- Increased number of projects at installations
 - Provides CO's more tools to achieve reductions
- Increased energy savings
- Concept exported to other Regions



Energy Success Stories

FY 2008 Energy Projects

- Executed \$45M in energy, water and renewable energy projects to save:
 - \$7.5M/year
 - 133,875 MBtus, 281 million gallons
- Planning \$90M in projects
 - \$9.3M savings
 - 230,000 MBtus, 159 million gallons
- Executed \$2.7M in low-cost/no-cost projects saving \$2.9M/year, 74,000 MBtus, 160 million gallons



Energy Success Stories

- FY01-08 Energy projects executed (~\$200M)
 - Facility improvements
 - Irrigation controls
 - Renewable energy systems
- Funding
 - Energy Conservation Improvement Program
 - Financed with local Utility (UESC)
 - Navy sustainment funds



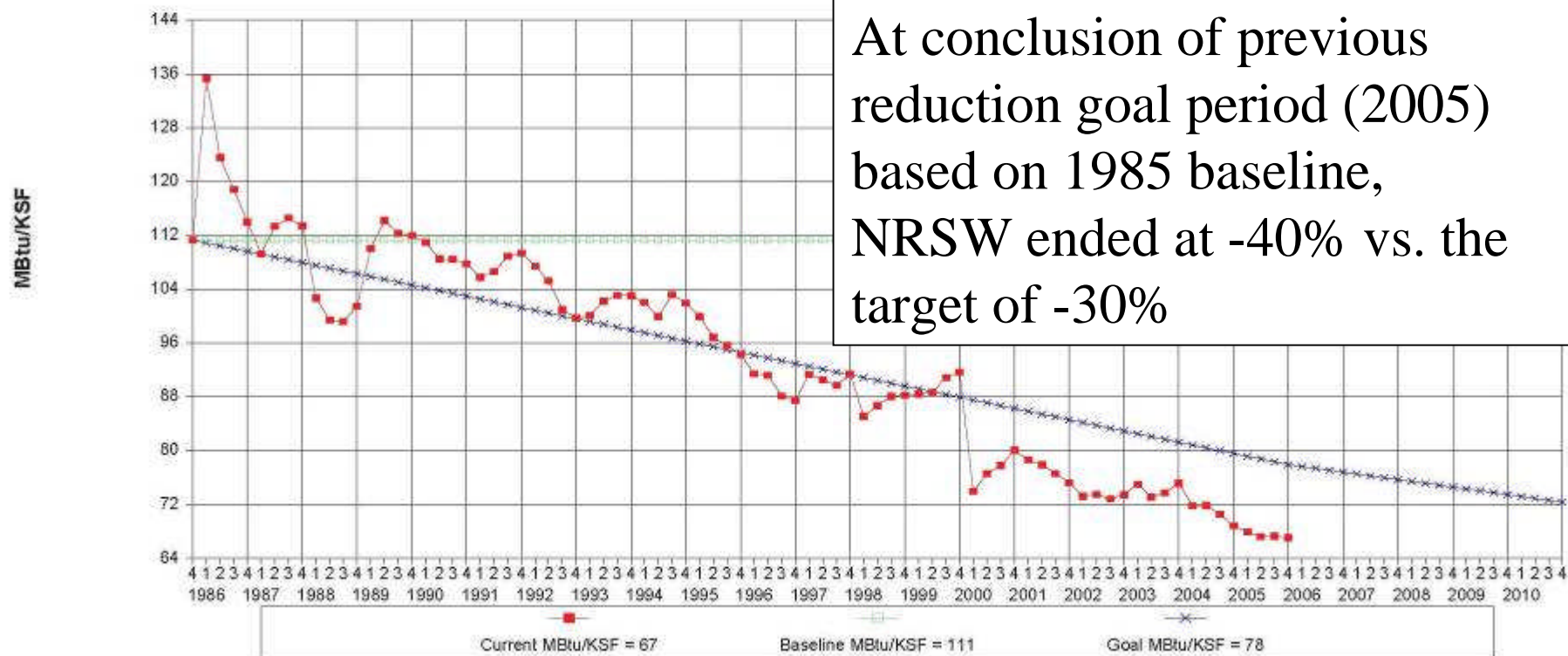
Energy Success Stories

Current Progress: -39.77%

Non-Industrial (Baseline 1985)

4th Quarter 2005 Reduction Goal: -30%

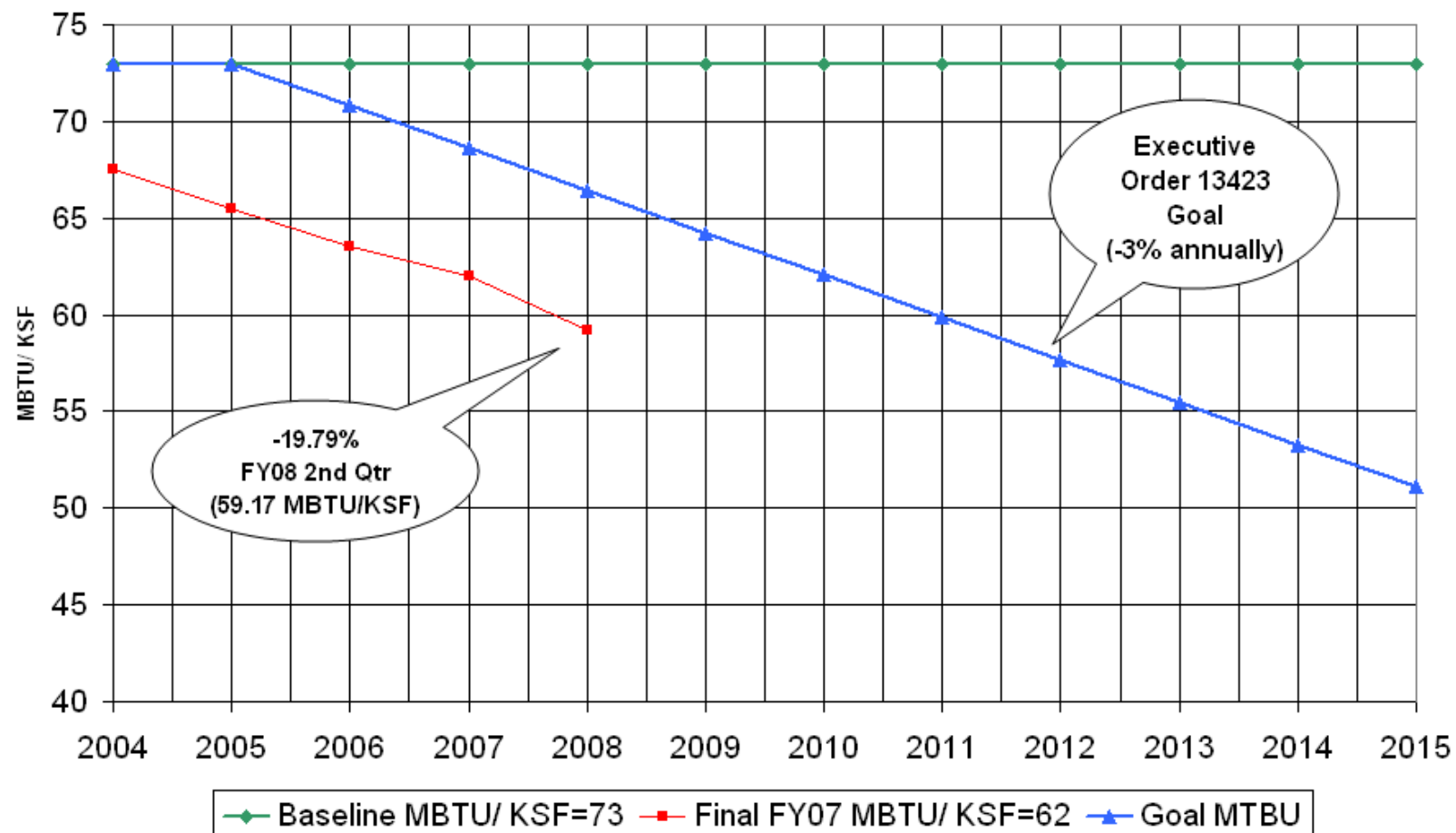
Energy Reduction Progress
All installations have reported data to be included in this chart.





Energy Success Stories

NRSW Energy Reduction Goals Progress
Through March 2008





Water Conservation Success



Before

After

Artificial turf

Naval Base San Diego

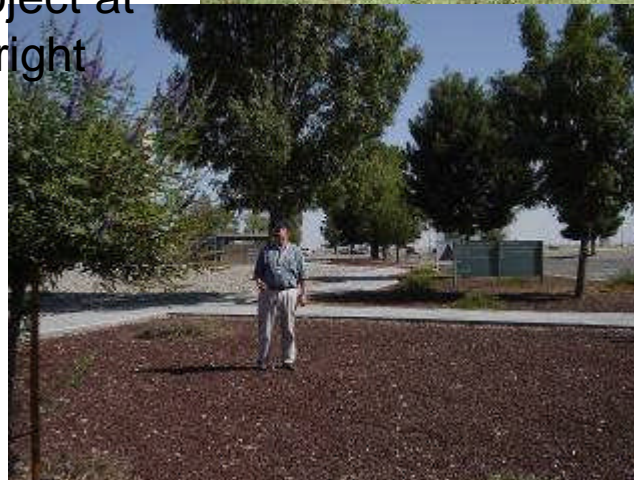
Building 72



Water Conservation Success

Smart & Desert Landscaping:

- NAS Fallon replaced 95% of turf with desert landscaping (top right) to save 236 million gallons
- All Region bases implementing xeriscaping – project at Naval Base Ventura County shown at right
- Smart landscaping project at NAB Coronado, bottom right
- NAS Lemoore using recycled tires to replace turf areas (bottom)





Water Conservation Success

Artificial Turf

ADM Kidd Club, Naval
Base Point Loma



Naval Base San Diego





Water Conservation Success

- ~1 billion gallons water savings annually vs. 2000
- FY08/09 irrigation improvements/ turf reduction projects in development (350M gallon savings)
- Water-free urinals
 - Installed over 400 units in FY08



Natural/Cultural Resources

Southwest Region

Endangered Species 43 Cultural Resources 19,000+

Note: More than half of the States manage fewer endangered species than CNRSW
[Rank 18th]

San Diego Metro

Endangered Species 35 Cultural Resources 8,500+

San Clemente Island

Endangered Species 18 Cultural Resources 7,600+

Note: [a] CNRSW is totally responsible for the recovery of eight endemic species, [b]
cultural resources are one of the most dense assortments in the United States



Natural Resources

SCI Loggerhead Shrike

- In 2000 – 13 Individuals
- Today more than 40 nesting pairs
- More than \$1M spent each year to ensure its survival
- No longer the most threatened species in North America





Natural Resources



Island Night Lizard

- Region started delisting process with U.S. Fish & Wildlife in 2006 for San Clemente Island and San Nicholas Island
- On target to be delisted in 2009



Cultural Resources

San Clemente Island

- 3,500 known archeological sites
- Est. 7,600 sites island-wide
- To the right is the remains of a 5,000 year old house excavated on the western shore of San Clemente Island





Cultural Resources



- Coso National Historic Landmark at NAWS China Lake
- Approximately 36,000 acres in size
- One the highest concentrations of rock art in the world
- Concentrations are centered on five canyons



Lower Renegade (Little Pet)





Upper Renegade Canyon





Sheep Canyon





Big Petroglyph Canyon





Seep Springs (South Range)





Integrated Solid Waste

Integrated Solid Waste

- Treated & Tracked as Commodities
- More than 100 commodities are tracked
- > 75% Diversion Rate
- Diverted over 136,000 tons of material away from the landfill and saved approximately 36,000 cubic yards of landfill space and 900 truck trips to the landfill.





Integrated Solid Waste



- 2007 “Recycler of the Year” by the City of San Diego.
- Recognition from the California Integrated Waste Management Board as one of the most effective diversion programs in the State of California



WASTE TO CLEAN ENERGY CONVERSION TECHNOLOGY PROJECT

- Miramar landfill scheduled to close 2012
- Estimated \$8M increase in Navy's refuse disposal costs
- Navy Environmental Sustainability Development to Integration (NESDI) R&D funding secured for WTCE conversion technology feasibility study
 - Begins Fall 2008
- Broad Agency Agreement to partner with UCLA for conducting the feasibility study
 - Part of Recycling / Municipal Solid Waste Management Certification Program to establish case study and benchmarking for the State of CA
- Study will identify optimal conversion technology to produce clean energy from Navy generated solid waste considering environmental and operational considerations
- Goal is zero waste through reducing, reusing, recycling, and converting solid waste to a resource and clean energy



Green Buildings

- In January, opening a Sustainable Interior Showroom (SIS) where Region Programs will be required to purchase only sustainable office furniture and carpet from approved sources. We are requiring a “take back” policy from all our vendors once product reaches its end of service
- SIS will be open to other Federal Agencies
- Beginning a Green Building Program. Bldg 850 in NBVC is LEED-Gold
- Several follow on projects will also meet LEED certification



Naval Base Ventura County

Bldg 850 – LEED Gold

- White House Closing the Circle Award 2006
- DoE Energy Showcase Site
- 31 KW PV



Biofuels

- Committed to the use of clean biodiesel and have used 182,000 gallons in 2008
- We have over 1000 FlexFuel vehicles in the San Diego metro area which can use corn based Ethanol





Partner, Partner, Partner

- Charter member of the **Federal Network for Sustainability (FNS)**
- FNS has 20 Federal Agencies (including NASA Ames)
- Located in Western US (EPA Regions VIII, IX, and X)
- Sponsored the first ever Federal Environmental Symposium-West in June 2008 with more than 300 attendees in Big Sky, Montana





Partner, Partner, Partner

- Charter member of the **San Diego Region Sustainability Partnership (SDRSP)**
- SDRSP has more than 40 members including CNRSW, UCSD, SDSU, Qualcomm, Kyocera, and the SD Airport Authority
- A primary source of sustainable information sharing and collaboration within San Diego



SDRSP representatives at the
California Green Summit in Sacramento
March 2009



Questions?



Back-up Slides



Way Ahead

Renewable Energy Program

- Regional/ integrated resource approach for renewable energy production and procurement across Southwest AOR. This approach will consider all aspects of renewable generation to emphasize sustainability and stability of our energy infrastructure, and exceeding Federal renewable goals.
- This approach will consider these opportunities:
 - Wholesale generation (selling of power) as appropriate by third party developer (similar to existing NAWS China Lake geothermal development)
 - Procuring renewable power on site through third party developer. Commonly referred to as Power Purchase Agreement.
 - Distributed generation on site - smaller generation through appropriated funds (similar to the many existing systems included above)
- These opportunities must be balanced with the stability and security of our energy infrastructure within the installation, and energy procurement at the regional level.
 - Close coordination with installations
 - Broad Regional approach for DoN



Way Ahead

Renewable Energy Program

- Future Plan
 - Continue coordination with the recently established Navy renewable energy program (RPO) team to develop renewable resources at NAWS China Lake and NAS Fallon
 - Document lessons learned and proceed with additional renewable resource developments throughout NRSW
 - Include Conversion technology (waste-to-clean energy) in potential renewable energy developments



Way Ahead

Renewable Energy Challenges

- Federal procurement processes and State/ Local utility processes do not align. Simple technical solutions constantly marketed by industry ignore these realities.
- These developments remain highly complex, requiring significant human capital resources.
- The investment tax credit was extended to 2016, but the fact remains these developments are costly, and achieving goals while maintaining or lowering current costs will be significantly challenging
- Each state has different rules and processes, which do not necessarily consider the relatively unique nature of the DoD (i.e., large, city-sized installations with significant loads)



Overview of Region Energy Policy

- Very strong Installation energy teams
 - Committed Commanding Officers
 - Focus on energy project development
 - Dedicated REM services at each installation
 - Focus on understanding/ refining utilities requirement (i.e., metrics)
 - Focus on CNIC UT requirement vs. providing utilities by NAVFAC PWDs (i.e., single shore integrator)
 - Every Installation strives for Platinum level achievement from annual energy report



Overview of Region Energy Policy

- Very strong centralized program management
 - Regional Commander focus
 - New Regional energy instruction at end of FY07
 - Consistent communication across Region
 - UT metrics, E-notes
 - Monthly region-wide energy program teleconferences with all REMs and energy managers at installations
 - Region review of all annual energy reports to ensure consistency
 - Fast-payback energy projects program
 - Focus on renewable energy resource development to exceed Federal goals
 - Focus on integrating sustainability into all aspects of shore platforms